

REMARKS

With the above amendments, claims 1-6 and 10-12 are pending in the application. Claims 7-9 were previously canceled without prejudice. Claims 10-12 are newly added. No new matter is being added.

Claim Rejection under 35 U.S.C. § 102

Claims 1-6 stand rejected as anticipated by Nagumo et al (USP 6,400,768). Applicants respectfully traverse this rejection.

Claim 1, as amended, recites as follows.

1. A method for encoding and decoding a video sequence in which a keyframe is used to bi-directionally predict frames in the sequence, the method comprising:
 - coding said keyframe independently of other frames in the sequence; and
 - predicting a **prior unidirectional** predicted frame occurring before said keyframe using data from said keyframe and not from any other keyframe, directly or indirectly; and
 - predicting a subsequent unidirectional predicted frame occurring after the keyframe using the data from said keyframe and not from any other keyframe, directly or indirectly.

(Emphasis added.)

As shown above, claim 1 is limited to a method having, among other limitations, the step of “predicting a **prior unidirectional** predicted frame occurring before said keyframe using data from said keyframe and not from any other keyframe, directly or indirectly”.

This limitation is supported in the specification, for example, in FIG. 3a and the corresponding description. For convenience of reference, FIG. 3a is reproduced below.

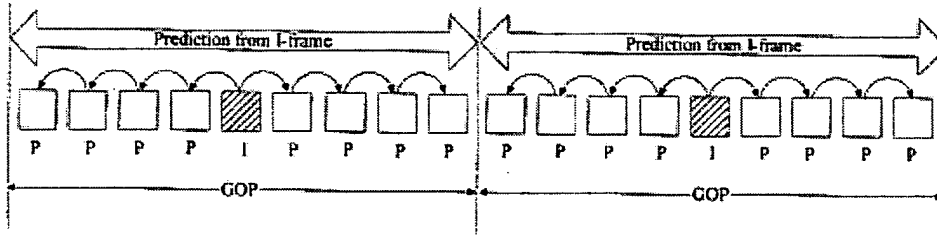


Fig. 3a

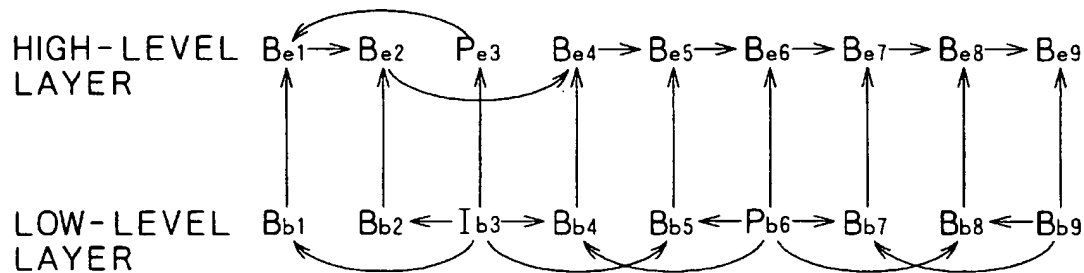
FIG. 3a is described in the specification on page 12, lines 1-11, as follows. As emphasized below, all the P-frames in FIG. 3a are **unidirectional** predicted frames.

Fig. 3a illustrates the concept of predicting bi-directionally from a single I-frame in accordance with an embodiment of the invention. Two GOPs from a video sequence are shown, and for each GOP the I-frame is taken to occur in the middle of the GOP. Note that in general the total number of P-frames in a GOP and the proportion of P-frames occurring before and after the I-frame may vary. **P-frames extend in either temporal direction from the central I-frame.** Backwards predictions are used to predict the P-frames that precede the I-frame, and forward predictions are used to predict the P-frames that follow the I-frame (in the usual manner). **Note that under this conception P-frames are frames that are predicted from a single direction, but that direction need not be the forward direction (in contradistinction to the MPEG standards and other known video coding standards).**

(Emphasis added.)

In contrast, similar to Hyodo et al cited in an earlier office action, Nagumo et al teaches a conventional technique. This is shown in FIG. 49 of Nagumo et al, which was cited in the latest office action and is reproduced below for convenience of reference.

FIG. 49



As shown above and cited in the latest office action, Nagumo et al teaches the use of data from the keyframe I_{b3} to predict frames before and after the keyframe I_{b3} . However, all the frames predicted **before** the keyframe I_{b3} are shown as **bi-directional** predicted frames B_{b1} and B_{b2} .

That each of the “B” frames is a bi-directional predicted frame is **expressly** taught by Nagumo et al. For example, col. 1, lines 54-58 states as follows. “The motion-vector detector 32 processes picture data of each frame as an **I-picture (in an intraframe encoding process)**, a **P-picture (in a forward-prediction encoding process)** of a **B-picture (in a bidirectional-prediction encoding process)**.” (Emphasis added.)

Therefore, Nagumo et al does not teach the claim limitation of “predicting a **prior unidirectional** predicted frame occurring before said keyframe using data from said keyframe and not from any other keyframe, directly or indirectly”.

For at least the above-discussed reasons, applicants respectfully submit that claim 1 is now patentably distinguished over Nagumo et al.

Claims 2-6 depend from claim 1. As such, claims 2-6 are patentably distinguished over Nagumo et al for at least the same reasons discussed above in relation to claim 1.

Moreover, claims 3 and 4 further recite “predicting **in series** all prior frames within the group of pictures that occur before the keyframe using data from the keyframe and not from any other keyframe” and “predicting **in series** all subsequent frames within the group of pictures that occur after the keyframe using data from the keyframe and not

from any other keyframe”, respectively. The prediction **in series** goes from one predicted frame to a next predicted frame serially, as shown in the above-reproduced Fig. 3a of the present application. (See the arrows which hop in series from frame to frame starting at the keyframe.) In contrast, Fig. 49 of Nagumo, also reproduced above, shows frames B_{b1} and B_{b2} being predicted **in parallel** (not in series) from keyframe I_{b3} . (See the arrows which both start at the keyframe and go to the predicted frames in parallel.)

Claims 10-12 are newly added and are further patentably distinguished over Nagumo et al. Claim 10 recites limitations similar to the limitations of claim 1 and is patentable over Nagumo et al for at least the reasons discussed above in relation to claim 1.

In addition, claim 10 recites “predicting **at least three** prior unidirectional predicted frames occurring before said keyframe using data from said keyframe and not from any other keyframe, directly or indirectly”. In contrast, Nagumo et al discloses **only two** predicted frames B_{b1} and B_{b2} prior to the keyframe I_{b3} .

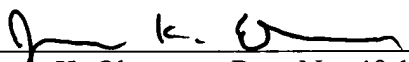
Conclusion

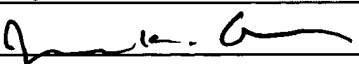
For at least the above reasons, it is respectfully submitted that claims 1-6 and 10-12 are shown to be patentable over the applied art. The Examiner is invited to telephone the undersigned at (408) 436-2111 for any questions.

If for any reason an insufficient fee has been paid, the Commissioner is hereby authorized to charge the insufficiency to Deposit Account No. 50-2427.

Respectfully submitted,

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